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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/814,979

03/30/2004

Scott Sibbett

21058/0206803-US0

8637

7278

7590

08/31/2007

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EXAMINER

NOGUEROLA, ALEXANDER STEPHAN

ART UNIT

PAPER NUMBER

1753

MAIL DATE

DELIVERY MODE

08/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,979	SIBBETT, SCOTT	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-11, 13-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-11 and 13-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/20/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

***Status of the Objections and Rejections pending since the Office action of
August 20, 2007***

1. All previous objections and rejections are withdrawn.

Claim Rejections - 35 USC § 112

2. Claims 1-3, 5-10, and 13-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent Claims 1 and 11 each require

a second pump electrode positioned in the second pump reservoir, wherein a voltage drop between the first and second pump electrodes causes electroosmotic flow in the first and second pump channels and convective flow in the particle separation channel.

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Independent claim 19 requires

an electroosmotic pump in communication with the particle separating channel at the first end, the electroosmotic pump creating convective flow in the particle separating channel to move the solution against the voltage gradient.

Independent claim 22 requires

applying a voltage drop between electrodes in an electroosmotic pump to create convective flow of a solution in a particle separation channel in communication therewith formed in a device.

The disclosure is not enabling because (1) it is inconsistent, if not contradictory, on how convective flow is to be generated, (2) it uses "convective flow" to refer to an unclear phenomenon that is something other than what is ordinarily understood by the term, and (3) contrary to what is suggested by the specification, counteractive chromatography, which appears to be the name for this technique of using electroosmosis to create a convective flow, is not well-known in the art.

As for the disclosure being inconsistent on how convective flow is generated, Applicant describes how to create convective flow in paragraph [0018] of the specification. This paragraph states, "The white area shown in channel 22 and reservoir 16 represents a region of suppressed electroosmotic flow. [emphasis added]" However, two sentences later, the same paragraph states, "Due to suppressed electroosmotic flow in channel 20 relative to channel 22, the unsuppressed electroosmotic flow in channel 22 creates a negative pressure in channel 18 as demanded by the equation of continuity.[emphasis added]" So channel 22 is stated to

have both suppressed electroosmotic flow and unsuppressed electroosmotic flow (presumably reservoir 16 also has suppressed and unsuppressed electroosmotic flow), which is an inconsistency, if not a contradiction.

As for the disclosure being unclear on what is meant by "convective," "Convection" is defined in the Webster's II New Riverside University Dictionary as "1. The act or process of conveying or transmitting. 2. *Physics*. a. Heat transfer by fluid motion between regions of unequal density that result from nonuniform heating. b. Fluid motion caused by an external force, as gravity. 3. *Meteorol*. The transfer of heat or other atmospheric properties by massive motion within the atmosphere, esp. by such motion directed upward." The first definition is a very broad definition that does not distinguish electroosmotic flow from convective flow. The second and third definitions of "convection" do not describe similar phenomena to what is described in paragraph [0018] of the specification and especially Paragraphs [0026] and [0037] of the specification. These paragraphs suggest that convective flow has a flat profile since it focuses charged molecules by balancing the force of electrophoresis, but this is not characteristic of what is conventionally thought of as convective flow, which is usually thought of as having a random flow profile (see, for example, the abstract and Figure 2 in Posner et al. Proceedings of IMECE2004-61042). Thus, it is not clear what is meant by "convective" flow or pumping. Moreover, no mention is made of convective pumping (negative pressure) also occurring in channel 20 of Figure 1, either in addition to or instead of electroosmotic flow (depending on whether electroosmotic flow is supposed to be suppressed or not in channel 20) and no mention is made of how electroosmosis is

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avoided in channel 18 (Figure 2), which further makes it unclear as to what convective pumping is. Since it is unclear what "convective pumping" refers to it would be difficult for one with ordinary skill in the art at the time of the invention to enable this aspect of the invention without some instruction from the Applicant via his disclosure.

As for the disclosure stating that Applicant's technique of using electroosmosis to create convective pumping is "typically known as counteractive chromatography" ([0037] in the specification), in a computer search of CAPLUS (a Chemical Abstracts, ACS, database) the Examiner did not find any articles that had "counteractive chromatography" in the title or abstract. In a search of the patent literature only four documents had the term "counteractive chromatography", all of which are pre-grant publication U.S. patent applications that had at least one inventor in common with the instant application. Thus, counteractive chromatography was not a well-known technique at the time of the invention. So one reading Applicant's disclosure at the time of the invention could not readily turn to another source for information in the art that would help enable the invention.

Paragraphs [0024]-[0025] in the specification similarly describes counteractive chromatography as in paragraph [0018], but without the inconsistency of a channel that has both suppressed and unsuppressed electroosmosis. However, neither paragraphs [0024]-[0025] nor any other portion of the specification clarifies what convective pumping is, how convective flow is avoided in the channel that has suppressed electrosmotic flow, and how electroosmosis is avoided in the channel in which convective flow occurs.

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For the reasons set forth above and because dependent claims will have the same enablement issues as the claims from which they depend, all of the pending claims are rejected as being not enable.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention: what is meant by "without transfer"? Since the focused charged particles are caused to migrate thru a sieve are they not being transferred?

Claim Objections

5. Claims 1 and 22 are objected to because of the following informalities:
- a) Claim 1, line 5: -- of -- should be inserted between "end" and "the";
 - b) Claim 22, line 6: -- in -- should be inserted between "focus" and "the".

Appropriate correction is required.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alex Noguera
Primary Examiner
AU 1753
August 29, 2007